

Situational analysis of exogenous intoxication in the state of Amapá, between 2015 and 2017

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Abstract— Exogenous intoxication is a collection of noxious effects represented by laboratorial and clinical manifestations that disclose the organic disproportion produced by the interaction of one or more toxic agents with the biological system. The aim of this work is to perform a situational analysis of exogenous intoxication in the state of Amapá during the period of 2015 to 2017. The form of study is retrospective with quantitative approach. The data sources used were DATASUS and the Brazilian Institute of Geography and Statistics – IBGE. Papers published in journals, BIREME database, LILACS, SciELO and data from the Ministry of Health were an additional sources. The results showed that in the period from January 1, 2015 to December 31, 2017, the total number of reports of endogenous intoxication by municipality of residence was 60 cases, and Macapá was the municipality that contributed with maximum notifications which is 86.6%. The most prevalent age group for exposure to toxic agents is the group of young adults between 20 and 39 years of age, with an average of 50% of the total cases with a predominance of female representing 53%. Among the substances that mostly caused these type of poisonings are the use Raticide with 30% and the use of drugs with 18%. It is concluded that exogenous intoxications are a risk to the public health and need to be minimized with more effective public policies by reducing the exposure of groups of risks that lead to accidents or that favors suicides.

Keywords— Exogenous intoxication, Suicide, Notifications.

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I. INTRODUCTION

Exogenous intoxication is the set of harmful effects represented by clinical or laboratory manifestations that reveal the organic imbalance produced by the interaction of one or more toxic agents with the biological system. These acute intoxications can cause clinical and / or biochemical consequences of exposure to chemical substances found in the environment (water, food, poisonous or venomous animals) or isolated (pesticides, medicines, household products) (Schvartsman & Schvartsman, 1999).

Toxic agents are mostly of anthropogenic origin, capable of causing damage and can cause death depending on the concentration and time of exposure. Taking the clinical history, in the evaluation of intoxication, becomes a challenge to identify the substances used, the quantities and the time elapsed. Detailed and systematic physical examination is the best solution for diagnosis and treatment guidance (Oliveira & Menezes, 2003). Among the agents, rodenticides in poisoning by accident and suicide attempts stood out. These substances, however, have been improperly diverted for use in domestic environments, since its uses are exclusive in farming (Dantas et al., 2013).

Currently, it has been found that the use of these products is more present among intoxications, either by intentional use or by accident. In 2002, the World Health Organization (WHO) estimated that in the world there were about 350 thousand deaths due to poisoning, with 10% being in children under 15 years of age, prevailing between 15 and 44 years (Werneck & Hasselmann, 2009). Among intentional intoxications, the main cause is suicide attempt. The most used substances are medicines, alcohol and pesticides (Santos, Legay, & Lovisi, 2013). The use of rodenticide is accidentally associated, but most cases of deaths observed are due to intentional exposure. The Aldicarb rodenticide is more used for high intake, even though it is illegal to sell it in Brazil (Batista et al., 2017). In the country there is no production of this product, but the commercialization is great in the domestic environment, since its use is for agricultural purposes, and when involved in cases of intoxications, they inhibit the enzyme acetylcholinesterase and it stops acting in the degradation of acetylcholine, which can lead to mortality if diagnosis is late (Vieira, 2004). The conducts in the hospital network range from the description of toxic agents, amounts and time of exposure and the procedures must be started as soon as possible; vomiting, nasogastric tube, gastric lavage, urine alkalization and activated carbon can be induced (Silva & Costa, 2018).

The agents related to the most serious cases of poisoning are pesticides, drugs and rodenticides. The highest prevalence in the number of notifications for medications and the age group most exposed to these products ranges from 1 to 4 years (22.06%) and from 20 to 29 years (17.72%) (Santos et al., 2014). This is because in Brazil several weaknesses facilitate the acquisition of products that contribute to intoxications, such as: deficient advertising of the risks of medicines, the acquisition of medicines without a medical prescription, fragility of packaging and abuse of drugs by the population (Silva & Costa, 2018).

It is worth mentioning that many of these notifications involve cases of suicide attempts. The World Health Organization (WHO) conceptualizes suicide as an intentional act of the individual to extinguish his own life (Schlichting & Moraes, 2018).

Suicide represents a public health problem for society, and is among the three main causes of death among adolescents and young adults and the identification of toxic agents can be a guide for the implementation of prevention measures (Vieira, Santana, & Suchara, 2015). For the World Health Organization (WHO), it is estimated that more than 1.5 million people by 2020 will commit suicide, being the most common practice for hanging, firearms and poisoning (Santos et al., 2014).

Thus, this work aimed to make a situational analysis of exogenous intoxication in the State of Amapá, from 2015 to 2017, addressing the age group; most prevalent sex; toxic agent and the circumstances of intoxication. Given the relevance of the topic to Public Health, it is essential to conduct a study that characterizes the population at risk, in order to direct health policies to minimize morbidity and mortality related to exogenous intoxications.

II. METHOD

A retrospective study was carried out, with a quantitative approach to the cases of exogenous intoxications reported in the State of Amapá in the period from 2015 to 2017. The data used was DATASUS and IBGE (Brazilian Institute of Geography and Statistics) 2010 census, considering all cases of exogenous intoxication notified from January 1, 2015 to December 31, 2017 residing in Amapá. For the analysis of this study, certain variables were adopted, being: municipality of residence, incidence rate, age group, sex, toxic agent and circumstances.

For the analysis of the statistical data, the programs Windows Word and Excel were used, the information was displayed in tables and for discussion the

available literature on the topic was used, based on the data network BIREME (Regional Library of Medicine), LILACS (Literature Latin American and Caribbean Health Sciences), SCIELO (Scientific Electronic Library Online) and Ministry of Health.

III. RESULTS

During the studied period, the total number of notified cases of endogenous intoxication was 60 cases, according to table 01, the cases were reported by municipality of residence. Between the years 2015 and 2017, it was possible to see an increase in cases of exogenous intoxications in the state of Amapá, comparing 2015 in relation to 2016 this increase was 150% in the state, and when related the year 2015 with 2017, the increase observed was more than 100% of the reported cases, with Macapá being the municipality that most contributed to the notifications, with 52 (86.6%) cases in the analyzed period.

Table 1: Notified cases of exogenous poisoning, by municipality of residence, Amapá, 2015 to 2017

Municipality of Residence	Notification year		
	2015	2016	2017
1 Macapá	09	24	19
2 Laranjal do Jarí	-	-	04
3 Porto Grande	01	-	-
4 Ferreira Gomes	-	01	01
5 Itaubal	-	-	01
Total	10	25	25

Source: Ministry of Health / SVS - Information System for Notifiable Diseases / DATASUS

Table 2 reveals the incidences of exogenous intoxication by municipality of residence, and Macapá showed an increase in incidence for every 100,000 inhabitants from 2.26 in 2015 to 6.03 in 2016. However, compared to other smaller municipalities, in 2017 its incidence it's smaller.

Table 2: Exogenous intoxication incidence rate for every 100,000 inhabitants per municipality, Amapá, 2015 to 2017

Municipality of Residence	Notification year		
	2015	2016	2017
1 Macapá	2,26	6,03	4,52
2 Laranjal do Jarí	-	-	5,02
3 Porto Grande	5,94	-	-
4 Ferreira Gomes	-	17,3	-
5 Itaubal	-	-	23,4
Total	8,2	23,33	32,94

Source: Ministry of Health / SVS - Information System for Notifiable Diseases / DATASUS

Regarding the age group, observed in table 3, the group that most prevailed in terms of exposure to toxic agents comprises young adults between 20 and 39 years old, with an average of 50% of the total cases reported. The population under 15 had a drop in cases, with an increase in the remainder, making a total number of 25 notifications between 2016 and 2017.

Table 3: Distribution of notified cases of exogenous poisoning by age group, Amapá, 2015 to 2017

Age Group	Notification year		
	2015	2016	2017
<1 year	-	01	01
1-4	-	03	01
10-14	-	02	-
15-19	-	05	07
20-39	10	13	12
40-59	-	01	04
Total	10	25	25

Source: Ministry of Health / SVS - Information System for Notifiable Diseases / DATASUS

As for the distribution by sex, table 4 shows that there is a slight predominance of female cases, which represents 53% of the total of notified cases. In Macapá, the discrepancy is greater, with the female group accounting for approximately 58% of cases.

Table 4: Distribution of notified cases of exogenous intoxication by sex, in the municipalities of the State of Amapá, 2015 to 2017

Municipality of Residence	Sex	
	Male	Female
1 Ferreira Gomes	01	-
2 Laranjal do Jari	01	01
3 Macapá	22	30
4 Porto Grande	-	01
5 Itaubal	01	-
Total	28	32

Source: Ministry of Health / SVS - Information System for Notifiable Diseases / DATASUS

Among the substances that most caused these intoxications, it can be seen in Table 5 that the use of Rodenticides leads with 18 (30%) cases out of 60 in the state's municipalities, while IGN - Ignored / Blank represents 13 cases (22%) and the use of drugs with 11 (18%).

Table 5: Distribution of notified cases of exogenous toxicity by toxic agent, Amapá, 2015 to 2017

Toxic Agent	Notification year		
	2015	2016	2017
Medicines	-	06	05
Household pesticides	-	01	01
Rodenticide	07	06	05
Veterinary Product	-	01	01
Home use product	-	02	01
Chemical product	01	-	01
Metal	-	-	01
Food and drink	-	-	02
Other	-	06	-
IGN - Ignored / Blank	02	03	08
Total	10	25	25

Source: Ministry of Health / SVS - Information System for Notifiable Diseases / DATASUS

Among the circumstances involved, table 6 shows a marked growth between 2015 and 2017 in the State of Amapá, among these events the suicide attempt is the most recurrent, making up 67% of the total; followed by accidental circumstances with 18% of the total. There is also the occurrence of 1 notification regarding homicide and violence in 2017.

Table 6: Distribution of notified cases of exogenous intoxication, according to circumstances, Amapá, 2015 to 2017

Circumstances	Notification year		
	2015	2016	2017
Accidental	01	07	03
Self-medication	-	01	-
Food intake	-	-	02
Suicide attempt	09	15	16
IGN - Ignored / Blank	-	02	03
Violence / homicide	-	-	01
Total	10	25	25

Source: Ministry of Health / SVS - Information System for Notifiable Diseases / DATASUS

IV. DISCUSSION

Exogenous intoxications are a reality in Brazilian health units and this scenario is no different in the state of Amapá. Many complications are not reported, making infeasible, which favors underreporting in several municipalities. Among the main substances used in intercurrents are pesticides, with frequencies of up to 90% in developing countries, while the use of medicines reaches 60%. In Brazil, exogenous intoxication is responsible for approximately 70% of reported cases (Santos, Legay, & Lovisi, 2013).

The agents related to the most serious cases of poisoning are pesticides, drugs and rodenticides and the age group most exposed to these products is between 1 to 4 years (22.06%) and 20 to 29 years (17.72%) (Santos et al., 2014). This reality is no different from Amapá, given that the most exposed age is 15 to 39 years and the most evident toxic agents were drugs and rodenticides. This Brazilian scenario is due to weaknesses that perhaps facilitate the purchase of products that contribute to intoxications, such as: deficient advertising of the risks of medications, the acquisition of medications without medical prescription, fragility of packaging and the abuse of drugs by the population (Silva & Costa, 2018).

It is worth mentioning that many of these toxic agents, when used in an abusive or uncontrolled manner, can favor the exposure of groups of risks to accidents or to self-ingestion. According to the World Health Organization, suicide is one of the three main causes of death in the young population between 15 and 44 years old, present in developed and developing countries, and the global suicide rate is around 11.5 deaths per 100 thousand inhabitants (Veloso et al., 2017). It was also noticed that this reality in the state of Amapá remains in relation to the world and Brazilian scenario in relation to the attempted suicide circumstance. Among suicides due to exogenous intoxication, young people and young adults are the ones who commit the most and it is up to the health establishments to notify the competent public body of cases of attempted suicide, specifically in self-inflicted exogenous intoxications (Oliveira et al., 2015). In addition, women attempt suicide more than men by taking drugs and other toxic substances (Ribeiro et al., 2018).

V. CONCLUSION

Exogenous intoxications represent a risk to the public health scenario and need to be minimized with more effective public policies, reducing the exposure of groups of risks that lead to accidents or that favor suicide.

REFERENCES

- [1] Batista, L. A., Sousa, M. D. R., Rocha, R. J., & Lacerda, E. M. C.B. (2017). Perfil epidemiológico dos casos de intoxicação notificados no Estado do Maranhão. *Revista de Investigação Biomédica*, 9 (2), 129-137. Retrieved from <http://www.ceuma.br/portalderevistas/index.php/RIB/article/view/121/pdf>
- [2] Dantas, J. S. S., Uchôa, S. L., Cavalcante, T. M. C., Pennafort, V. P. S., & Caetano, J. Á. (2013). Perfil do paciente com intoxicação exógena por “chumbinho” na abordagem inicial em serviço de emergência. *Revista Eletrônica de Enfermagem*, 15 (1), 54-60. Doi: 10.5216/ree.v15i1.15506.
- [3] Instituto Brasileiro de Geografia e Estatística. (2017). **Área territorial Brasileira**. Retrieved August 15, 2018, from <https://cidades.ibge.gov.br>.
- [4] Ministério da Saúde. (2016). DATASUS: **Sistema de Informação de Agravos de Notificação. Intoxicação exógena**. Retrieved October 08, 2018, from <http://www2.datasus.gov.br/DATASUS/index.php?are a=0203&id=29878153>
- [5] Oliveira, R. D., & Menezes, J. B. (2003). Intoxicações exógenas em clínica médica. *Simpósio: Urgências e emergências dermatológicas e toxicológicas*, 36, 472 - 479. Retrieved from <http://www.revistas.usp.br/rmrp/article/view/773/785>
- [6] Oliveira, E. N., Félix, T. A., Mendonça, C. B. L., Souza, D. R., Ferreira, G. B., Freire, M. A., Lima, P. S. F., Teodósio, T. B. T., Linhares, J. M., & Almeida, P. C. (2015). Tentativa de suicídio por intoxicação exógena: contexto de notificações compulsórias. *Gestão & Saúde*. 6 (3), 2497 – 2511. Retrieved from <http://periodicos.unb.br/index.php/rgs/article /view/3125/2811>
- [7] Ribeiro, N. M., Castro, S. S., Scatena, L. M., & Haas, V. J. (2018). Análise da tendência temporal do suicídio e de sistemas de informações em saúde em relação às tentativas de suicídio. *Texto e Contexto da Enfermagem*, 27 (2), 1-11. Retrieved from <https://doi.org/10.1590/0104-070720180002110016>
- [8] Schvartsman, Cláudio, & Schvartsman, Samuel. (1999). Intoxicações exógenas agudas. *Jornal de Pediatria*, 75 (2), 244 – 250. Retrieved from <http://www.nesc.ufrj.br/cursos/saudetrab/INTOXICACOES .AGUDAS.pdf>
- [9] Santos, S. A., Legay, L. F., & Lovisi, G. M. (2013). Substâncias tóxicas e tentativas de suicídios: considerações sobre acesso e medidas restritivas. *Caderno de Saúde Coletiva*, 21 (1), 53-61. Retrieved from <http://www.scielo.br/pdf/cadsc/v21n1/a09.pdf>
- [10] Santos, L. C., Sousa, M. C. A., Castro, N. J., Trigo, T. J. B., & Kashiwabara, T. G. B. (2014). Intoxicação aguda uma revisão de literatura. *Brazilian Journal of Surgery and Clinical Research*, 7 (2), 28-32. Retrieved from https://www.mastereditora.com.br/periodico/20140702_16 5222.pdf
- [11] Santos, S. A., Legay, L. F., Aguiar, F. P., Lovisi, G. M., Abelha, L., & Oliveira, S. P. (2014). Tentativas e suicídios por intoxicação exógena no Rio de Janeiro, Brasil: análise das informações através do linkage probabilístico. *Caderno de Saúde Pública*, 30, (5), 1057-1066. Retrieved from <https://doi.org/10.1590/0102-311X00054213>
- [12] Silva, H. C. G., & Costa, J. B. (2015). Intoxicação exógena: casos no Estado de Santa Catarina no período de 2011 a 2015. *Arquivos Catarinenses de Medicina*, 47 (3), 02-15. Retrieved from <http://www.acm.org.br/acm/seer/index.php/a rquivos/article/view/226/288>
- [13] Schlichting, C. A., & Moraes, M. C. L. (2018). Mortalidade por suicídio na adolescência: uma revisão. *Revista Família, Ciclos de Vida e Saúde no Contexto Social*, 6 (1), 357 - 363. Doi: 10.18554/refacs.v6i0.2922
- [14] Veloso, C., Monteiro, C. F. S., Veloso, L. U. P., Figueiredo, M. L. F., Fonseca, R. S. B., Araújo, T. M. E., & Machado, R.S. (2017). Violência autoinfligida por intoxicação exógena em um serviço de urgência e emergência. *Revista Gaúcha de Enfermagem*, 38 (2), 1-8. Doi: <http://dx.doi.org/10.1590/1983-1447.2017.02.66187>
- [15] Vieira, L. J. E. S., Silva, A. N. D., Frota, M. A., & Albuquerque, V. L. M. (2004). Envenenamento por carbamato em crianças: estudo descritivo. *Revista Brasileira de Pesquisa em Saúde*, 17, (4), 193-199. Retrieved from <https://periodicos.unifor.br/RBPS/article/vie wFile/699/2067>
- [16] Vieira, L. P., Santana, V. T. P. & Suchara, E. A. (2015). Caracterização de tentativas de suicídios por substâncias exógenas. *Caderno de Saúde Coletiva*, 23, (2), 118 – 123. DOI: 10.1590/1414-462X201500010074
- [17] Werneck, G. L., & Hasselmann, M. H. (2009). Intoxicações exógenas em crianças menores de seis anos atendidas em hospitais da região metropolitana do Rio de Janeiro. *Associação Médica Brasileira*, 55, (3), 302-307. Retrieved from <http://www.scielo.br/pdf/ramb/v55n3/v55n3a 23.pdf>